AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1.   (currently amended) A control program testing method for testing a control program which is written in a certain programming language by use of an automatic code generator which produces automatically a control program which is ~~similar~~corresponding in contents with a control model indicating a control specification and written in the certain programming language to perform the control model, with requisite control specifications thereof being written in a requisite control specifications writing language, the control program testing method comprising steps of:

producing operation results of a simulator which simulates operation of the control model and operation results of program execution section which executes the control program, while making a relational linkage between each of corresponding operation results; and

testing presence or absence of abnormality in at least one of the control model and the control program with respect to each relational linkage;

wherein said each relational linkage is made about ~~similar~~corresponding contents between the control model and the control program based on correspondence information which indicates a correspondence relationship between the control model which is provided at automatic generation of the control program by the automatic code generator and the control program which is produced from the control model.

2.   (canceled)

3.   (previously presented) The control program testing method as in claim 1,

wherein the relational linkage is made for one of the control model and the control

program based on the setting of a break point which specifies a suspend point of operation and

for the other based on a setting of a corresponding break point based on the correspondence

information.

4.   (previously presented)   The control program testing method as in claim 3,

wherein the break point is adapted to set individually for functional blocks which

constitute the control model.

5.   (currently amended) The control program testing method as in claim 1,

wherein output of operation results, with the relational linkage being made between ~~the~~

~~individual~~each of corresponding operation results, is implemented based on the execution and

suspend of the control program, one line at a time, by the program execution section.

6.   (previously presented) The control program testing method as in claim 1,

wherein the testing of the presence or absence of abnormality is implemented by a

comparator which compares successively between the operation results of the simulator and the

operation results of the program execution section in relational linkage.

7.   (previously presented) The control program testing method as in claim 6,

wherein the successive comparison between the operation results of the simulator and the

operation results of the program execution section by the comparator is implemented in terms of

comparison between simulation sequence of the control model and execution sequence of the control program based on the correspondence information.

8.   (previously presented) The control program testing method as in claim 6, wherein the successive comparison between the operation results of the simulator and the operation results of the program execution section by the comparator is implemented in terms of comparison between variable values which are calculated by the simulation of the control model and variable values which are calculated by the execution of the control program based on the correspondence information.

9.   (previously presented) The control program testing method as in claim 8, wherein the testing of the presence or absence of abnormality by comparison between the variable values which are calculated by the simulation of the control model and the variable values which are calculated by the execution of the control program based on the correspondence information is implemented in terms of determination as to whether or not the difference between the variable values calculated by the simulation of the control model and the variable values calculated by the execution of the control program is within an allowable range.

10.   (previously presented) The control program testing method as in claim 6 further comprising the step of:

producing, in the event of determination of the presence of abnormality by the comparator, a simulation spot of the control model and an execution spot of the control program at a time point of the determination as a result of the test.

11.   (currently amended)   The control program testing method as in claim 1 further comprising the step of:

making alterable at least one of [[the]] variable values held at a suspend point among the variable values calculated by the simulation of the control model and the variable values held at the suspend point among the variable values calculated by the execution of the control program when the simulation of the control model and the execution of the control program are suspended during the test.

12.   (currently amended) The control program testing method as in claim 1 further comprising the step of:

producing at least the operation results of the simulator which simulates the operation of the control model and the operation results of the program execution section which executes the control program to a display to display visually.

13.   (currently amended) A control program testing apparatus for testing a control program which is written in a certain programming language by use of automatic code generation means which produces automatically a control program which is similarcorresponding in contents with a control model indicating a control specification and written in the certain programming language to perform the control model, with requisite control specifications thereof being written in a requisite control specifications writing language, the control program testing apparatus comprising:

synchronizing means which produces operation results of simulation means which simulates operation of the control model and operation results of program execution means which executes the control program, while making a relational linkage between each of corresponding operation results, the simulation means and the program execution means being operated concurrently; and

testing means for testing presence or absence of abnormality in at least one of the control model and the control program based on output operation results with respect to each relational linkage;

wherein the synchronizing means makes said each relational linkage about ~~similar~~corresponding contents between the control model and the control program based on correspondence information which indicates a correspondence relationship between the control model which is provided at automatic generation of the control program by the automatic code generation means and the control program which is produced from the control model.

14.   (canceled)

15.   (previously presented) The control program testing apparatus as in claim 13, wherein the synchronizing means makes the relational linkage for one of the control model and the control program based on the setting of a break point which specifies a suspend point of operation and for the other based on setting of a corresponding break point based on the correspondence information.

16.   (currently amended)   The control program testing apparatus as in claim 15,

wherein the break point is set individually for functional blocks which constitute the control model and the synchronizing means causes simulation means and the program execution means to operate in a synchronized manner.

17.   (currently amended) The control program testing apparatus as in claim 13,

wherein output of operation result by the synchronizing means is implemented based on the execution and suspend of the control program, one line at a time, by the program execution means and the synchronizing means causes simulation means and the program execution means to operate in a synchronized manner.

18.   (previously presented) The control program testing apparatus as in claim 13 further comprising:

comparing means which implements the testing of the presence or absence of abnormality by comparing successively between the operation results of the simulation means and the operation results of the program execution means in relational linkage.

19.   (previously presented) The control program testing apparatus as in claim 18,

wherein the successive comparison between the operation results of the simulation means and the operation results of the program execution means by the comparing means is implemented in terms of comparison between a simulation sequence of the control model and an execution sequence of the control program based on the correspondence information.

20.   (previously presented) The control program testing apparatus as in claim 18,

wherein the successive comparison between the operation results of the simulation means and the operation results of the program execution means by the comparison means is implemented in terms of comparison between variable values which are calculated by the simulation of the control model and variable values which are calculated by the execution of the control program based on the correspondence information.

21.   (previously presented) The control program testing apparatus as in claim 20,

wherein the testing of the presence or absence of abnormality by comparison between variable values calculated by the simulation of the control model and variable values calculated by the execution of the control program based on the correspondence information is implemented in terms of determination as to whether or not the difference between the variable values calculated by the simulation of the control model and the variable values calculated by the execution of the control program is within an allowable range.

22.   (previously presented) The control program testing apparatus as in claim 18 further comprising:

producing, in the event of determination of the presence of abnormality by the comparing means, a simulation spot of the control model and an execution spot of the control program at a time point of the determination as a result of the test.

23.   (currently amended) The control program testing apparatus as in claim 13 further comprising:

making alterable at least one of [[the]] variable values held at a suspend point among the variable values calculated by the simulation of the control model and the variable values held at the suspend point among the variable values calculated by the execution of the control program when the simulation of the control model and the execution of the control program are suspended during the test.

24. (currently amended) The control program testing apparatus as in claim 13 further comprising:

display means which is adapted to display visually at least the operation results of the simulation means which simulates the operation of the control model and the operation results of the program execution means which executes the control program.

25. (currently amended) A computer readable medium tangibly storing therein a control program testing program which is used for testing a control program which is written in a certain programming language by use of an automatic code generator which produces automatically a control program which is ~~similar~~corresponding in contents with a control model indicating a control specification and written in the certain programming language to perform the control model, with requisite control specifications thereof being written in a requisite control specifications writing language, the control program testing program, upon execution through a computer, performing steps comprising:

testing presence or absence of abnormality in at least one of the control model and the control program;

generating, from information provided at automatic generation of the control program, correspondence information which indicates a correspondence relationship between the control model and the control program, and making a relational linkage between each of a plurality of suspend points of operation of a simulator which simulates the control model and a corresponding one of a plurality of suspend points of operation of program execution section which executes the control program based on the correspondence information;

directing the simulator and the program execution section to proceed to the simulation and the program execution;

detecting a suspend of the simulator and a suspend of the program execution section following the simulation and program execution; and

comparing a simulation result of the control model and an execution result of the control program upon detecting suspends of simulation and program execution, and testing the presence or absence of abnormality based on the comparison result with respect to each relational linkage;

wherein said each relational linkage is made about ~~similar~~corresponding contents between the control model and the control program based on correspondence information which indicates a correspondence relationship between the control model which is provided at automatic generation of the control program by the automatic code generator and the control program which is produced from the control model.

26.   (previously presented) The computer readable medium tangibly storing therein control program testing program as in claim 25,

wherein the correspondence information includes execution position correspondence information which is information indicating the relationship between corresponding positions of the control model and the control program, and

wherein the making of a relational linkage of suspend points based on the correspondence information is that which sets, by being rendered the setting of a break point which specifies a suspend point of operation of one of the simulator and the program execution section, a break point which specifies a corresponding spot of the other based on the execution position correspondence information.

27.   (previously presented) The computer readable medium tangibly storing therein a control program testing program as in claim 26,

wherein the testing of the presence or absence of abnormality based on the comparison result tests the presence or absence of abnormality by at least comparing one of the suspend points of simulation of the control model and one of the suspend points of execution of the control program based on the execution position correspondence information.

28.   (previously presented) The computer readable medium tangibly storing therein a control program testing program as in claim 25,

wherein the correspondence information includes variable correspondence information which indicates a correspondence relationship between variable values pertaining to processing of the control model and variable values pertaining to processing of the control program, and

wherein the testing of the presence or absence of abnormality based on the comparison result tests the presence or absence of abnormality by at least comparing the variable values

calculated by the simulation of the control model and the variable values calculated by the

execution of the control program based on the variable correspondence information.

29.   (currently amended) A computer readable medium tangibly storing therein a

control program testing program which is used for testing a control program which is written in a

certain programming language by use of an automatic code generator which produces

automatically a control program which is ~~similar~~corresponding in contents with a control model

indicating a control specification and written in the certain programming language to perform the

control model, with requisite control specifications thereof being written in a requisite control

specifications writing language, the control program testing program upon execution through a

computer, performing:

testing of presence or absence of abnormality in at least one of the control model and the

control program;

generating, from information provided at automatic generation of the control program,

correspondence information which indicates a correspondence relationship between the control

model and the control program, and making a relational linkage between each of a plurality of

suspend points of operation of a simulator which simulates the control model and a

corresponding one of a plurality of suspend points of operation of program execution section

which executes the control program based on the correspondence information, the testing of

presence or absence of abnormality in at least one of the control model and the control program

being made with respect to each relational linkage;

directing the simulator and the program execution section to proceed to the simulation

and the program execution;

detecting a suspend of the simulator and a suspend of the program execution section following the simulation and program execution; and

producing a simulation result of the simulator and an execution result of the program execution section upon detecting suspends of simulation and program execution;

wherein said each relational linkage is made about ~~similar~~corresponding contents between the control model and the control program based on correspondence information which indicates a correspondence relationship between the control model which is provided at automatic generation of the control program by the automatic code generator and the control program which is produced from the control model.

30.   (previously presented) The computer readable medium tangibly storing therein a control program testing program as in claim 29,

wherein the producing of the simulation result of the simulator and the execution result of the program execution section comprises producing operation results to a display to display visually.

31.   (previously presented) The computer readable medium tangibly storing therein a control program testing program as in claim 29,

wherein the correspondence information includes execution position correspondence information which is information indicating the relationship between corresponding positions of the control model and the control program, and

wherein the making of a relational linkage of suspend points based on the correspondence information is designed to set, by being rendered the setting of a break point which specifies a

suspend point of operation of one of the simulator and the program execution section, a break

point which specifies a corresponding spot of the other based on the execution position

correspondence information.